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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CHANG, AUDREY Y

ART UNIT PAPER NUMBER

2872

DATE MAILED: 12/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/987,793

Applicant(s)

KLEINBERGER ET AL.

Examiner

Audrey Y. Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5-16,21,23,25,26,28 and 29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 5-16, 21, 23, 25, 26 and 28-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on **October 6, 2004** has been entered.

2. This Office Action is also in response to applicant's amendment filed on **April 28, 2004**, which has been entered into the file.

3. By this amendment, the applicant has amended claims 1, 7, 14, 16, and 21 and canceled claims 19-20, 22, 24, 30 and 31.

4. Claims 1, 5-16, 21, 23, 25-26 and 28-29 remain pending in this application.

5. The rejections to claims 22, 24, 27, and 30-31 under 35 USC 112, first paragraph, set forth in the previous Office Action are **withdrawn** in response to applicant's amendment.

6. The rejections to claims 19-20 and 31 under 35 USC 112, second paragraph, set forth in the previous Office Action are **withdrawn** in response to applicant's amendment.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 6, 14, 15, 21, 26, 28 and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by patent issued to Isono et al (PN. 5,315,377).

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Isono et al teaches a *three-dimensional image display device* that is comprised of a *liquid crystal panel* (46), serves as the *display*, for displaying right eye and left eye images in an alternative fashion within a frame and a *liquid crystal panel* (28) for generating *parallax barrier*, that serves as the *shutter layer*, having alternative first and second *subareas* that are operated to be opaque (first phase of operation) and transparent (second phase of operation) such that the right eye image and left eye image is directed to right eye and left eye of an observer *respectively* to enable stereoscopic image display, (please see Figure 1, column 4). Isono et al teaches that the image display device also comprises a computer (20), drivers and controller means for synchronizing the display of the image and the generation of the parallax barrier, (please see Figure 1 and columns 5-6).

Claims 1, 14 and 21 have been amended to make the layer of shutter means having multiple switchable element and the multiple switchable elements are operable to create horizontally contiguous alternating first and second subareas of the shutter includes a *plurality of horizontally contiguous* element of the switchable elements. Isono et al teaches that the parallax barrier is generated by a liquid crystal panel (28), which implicitly consists of a *matrix of light valve pixels* such that each of the pixels is electronically switchable. The matrix of pixels therefore serves as the *plurality of switchable shutter elements*. Isono et al also teaches that the parallax barrier comprises a *plurality of stripes* that is transparent and a *plurality of stripes* that is opaque. It is **implicitly** true that each of the stripes or subareas is formed by or includes a *plurality of horizontally contiguous* pixels that are switched to be either transparent or opaque. Isono et al teaches that the *size* of the transparent stripe is “B” and it is determined by the pixel size of the *display device* and the *distance* between the image display and barrier panel (D) and the *distance* between the observer and the image display (C), (please see column 9), this means that the size “B” is a *variable* and should be *adjusted* when the abovementioned distances are changed. This *implicitly* means that for *different size or values of B* for the transparent pixel stripe, different number of switchable pixels in the barrier panel is used. Furthermore, Isono et al teaches that a

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variable size of the transparent and opaque barrier stripes may be used (Figure 6D), that means a *plurality* of switchable pixels have to be used to achieve such variable sizes of transparent and opaque barrier stripes. The subareas or the transparent and opaque areas or stripes are *horizontally contiguous*.

With regard to claims 28 and 29, Isono et al teaches that the positions and the pitch size of the barrier stripes can be adjusted by the computer and the driver.

With regard to claims 6, 14, 21, and 26 Isono et al teaches to use a *head position-detecting unit* (8, Figure 1) to detect the head or eye position of the observer wherein the detected information is fed in a computer for computing and changing the generation of the shutter means to accommodate the variation in position of the viewer.

Claims 1, 14 and 21 have been amended to include the feature that the three dimensional viewing is maintained when the head of the observer is moved within the distance of the eyes. As demonstrated in Figure 3, the viewing point of the images at the position of the observer has a *finite extend* which means the three dimensional view will be maintained when the eye is moved within the finite extend. Furthermore, the finite extend has to be less than the distance between the eye, since if the distance is greater or equal to the eye distance, the barrier will just shifted in position in opposite mode to accommodate the right eye in the original left eye position.

This reference has therefore anticipated the claim.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. **Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Isono et al.**

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The three-dimensional image display with parallax barrier generated by a liquid crystal panel taught by Isono et al as described for claim 1 above has met all the limitations of the claim. This reference however does not teach explicitly that there are additional layers of shutter but such modification is considered to be obvious matter of design choice to one skilled in the art for the purpose of changing the design or for the benefit of providing additional switching means for the shutter means.

11. Claim 7, 13, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Morishima et al, (PN. 5,875,055).

Morishima et al teaches a *stereoscopic image display apparatus* that is comprised of a *liquid crystal display* (1) for displaying a *frame* having *first and second subregions for alternatively presenting left eye image and right eye image*, (Figure 6, 1-11'), a *polarizer*, serves as the *first light polarizing sublayer*, **within** the liquid crystal display for predetermined polarize the image light from the display, a *phase shifter member* (30), comprising *light rotating elements*, and a *polarization optical element* (2), serves as the *second light polarizing sublayer*, that together serve as the *shutter means* for allowing the right image light and left image light to reach observer's right eye and left respectively, (please see Figure 1 and column 5). Morishima et al teaches that the apparatus further comprises an *image processing means* (3) that serves as the *coordinating element* that controls the synchronization between the display of the image on the display and the switching of the phase shift member (3), therefore the shutter means, to enable the stereoscopic display.

Claims 7 and 16 have been amended to make the layer of shutter means having multiple switchable *horizontally* contiguous light rotating element and the subareas of the shutter includes a plurality of contiguous element of the switchable elements. Morishima et al teaches that the phase shifter member or light rotating element is a π -cell. In a different embodiment, Morishima et al teaches that the phase shifter member may comprise a **plurality** of *on and off switchable phase shifting regions*

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(30-y1 to 30-y5 in Figures 7B and 8B), serves as the plurality of light rotating, such that the polarization state of the light would be rotated or not rotated in OFF or ON state in the manner as demonstrated in Figures 3B and 3A. In Figures 5, 7B and 8B, Morishima et al teaches explicitly that phase shifting subareas, that eventually gives rise to transparent or opaque subareas may include a plurality of contiguous phase shifting regions. Morishima et al further teaches that the each region of the phase shifter member or π -cell could be *independently controlled* by the π -cell drive circuit (31) as demonstrated in Figure 5, where it serves as the *multi-line controlling switching means*, (please see column 10, lines 54-60). Although this reference does not teach explicitly that the phase sifting regions are necessarily vertically across the layer and horizontally contiguous, however this reference does teach the structural relationship between the *image subareas*, the *light rotating subareas* and the *polarizer subareas* and the *theory* behind it so that switchable shutter may be formed to allow stereoscopic viewing of the image. The modification, which concerns the geometric arrangement of the phase shifting members, therefore is considered to be obvious within the general skill of the worker in the art for the benefit of providing alternative arrangement to achieve the same thing namely stereoscopic viewing.

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With regard to claim 13, this reference does not teach explicitly that there are additional layers of shutter however such modification is considered to be obvious matter of design choice to one skilled in the art for the purpose of changing the design or for the benefit of providing additional switching means for the shutter means.

With regard to claims 7 and 16, this reference teaches that the phase shifter π -cell is controlled in a *multi-line controlling switching fashion* using a π -cell drive circuit but it does not teach explicitly to use a computing means to utilize the drive circuit. However this feature is either inherently met by the disclosure in order for the drive circuit performs the cited function in the claims or an obvious modification to one skilled in the art for the benefit of using a computing means to more accurately control the drive circuit.

Claims 7 and 16 have been amended to include the feature that the three dimensional viewing is maintained when the head of the observer is moved within the distance of the eyes. It is implicitly true that the viewing point of the images at the position of the observer has a finite extend which means the three dimensional view will be maintained when the eye is moved within the finite extend. Furthermore, the finite extend has to be less than the distance between the eye, since if the distance is greater or equal to the eye distance, the barrier will just be shifted in position in opposite mode to accommodate the right eye in the original left eye position.

12. Claims 23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Isono in view of the patent issued to Morishima et al.

The stereoscopic image display system taught by Isono et al as described for claims 1 and 14 above has met all the limitations of the claims. This reference however does not teach explicitly to use polarization sublayer and polarization rotating element as shutter means. However such combination, namely using polarization rotating element within polarizer pair, to create shutter means is a quite well

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known practice in the art. **Morishima et al**, in the same field of endeavor teaches such explicitly were by having a polarizer in the LCD display and a polarization optical element, served as the first and second light polarizing sublayers, and a phase shift member having multiple on and off switchable polarization rotating regions as shutter means, is disclosed. **Morishima et al** teaches that the phase shifter member is a π -cell and which may comprise a **plurality of on and off switchable phase shifting regions** (30-y1 to 30-y5 in Figures 7B and 8B), serve as the switchable elements, such that the polarization state of the light would be rotated or not rotated in OFF or ON state in the manner as demonstrated in Figures 3B and 3A. In Figures 5, 7B and 8B, **Morishima et al** teaches explicitly that phase shifting subareas, that eventually gives rise to transparent or opaque subareas, may include a plurality of contiguous phase shifting regions. **Morishima et al** further teaches that the each region of the phase shifter member or π -cell could be *independently controlled* by the π -cell drive circuit (31) as demonstrated in Figure 5, where it serves as the *multi-line controlling switching means*, (please see column 10, lines 54-60). It would then have been obvious to one skilled in the art to apply the teachings of **Morishima et al** to use polarizers and phase shifting member to create the barrier panel of **Isono et al** for the benefit of using alternative means to achieve the same three dimensional display function.

Isono et al further teaches to use a *head position-detecting unit* (8, Figure 1) to detect the head or eye position of the observer wherein the detected information is fed in a computer for changing the generation of the shutter means.

13. Claims 8-12 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to **Morishima et al** as applied to claims 7 and 16 above, and further in view of the patent issued to **Isono et al**.

The stereoscopic image display apparatus taught by **Morishima et al**, having a polarizer in the LCD display and a polarization optical element, served as the first and second light polarizing sublayers,

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and a phase shift member having multiple on and off switchable polarization rotating regions as shutter means, (with details described for claims 7 and 16), has met all the limitations of the claims.

This reference further does not teach explicitly to use means for sensing the position of the viewer. Isono et al teaches to use a *head position-detecting unit* (8, Figure 1) to detect the head or eye position of the observer wherein the detected information is fed in a computer for changing the generation of the shutter means. It would then have been obvious to one skilled in the art to apply the teachings of Isono et al to use a head position detecting unit and a computer means to calculate the shift of the position of the observer to adjust the generation of the shutter means for the benefit of providing a stereoscopic image display that accommodates the change of the position of the observer.

Terminal Disclaimer

14. The terminal disclaimer filed on April 28, 2004 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of US patent 5,822,117 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Response to Arguments

15. Applicant's arguments filed on April 28, 2004 have been fully considered but they are not persuasive. The newly amended claims have been fully considered and they are rejected for the reasons stated above.

16. Applicant's arguments are mainly concerned the amended features in the claims and they have been fully addressed in the claims. The applicant is respectfully noted that the cited Morishima reference is relied upon to provide the **theoretical** teachings of using polarization means and polarization rotating means to create switchable shutter means.

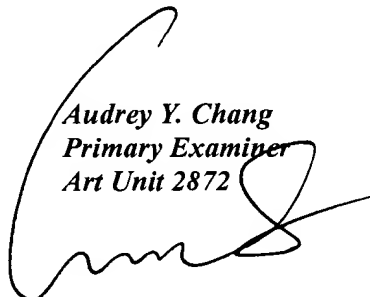
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A. Chang, Ph.D.


Audrey Y. Chang
Primary Examiner
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